REMARKS

In the office action the examiner rejected claim 1-23 under 35 USC 112, first and second paragraphs, as failing to comply with the written description and enablement requirements, and for failing to particularly point out and distinctly claim the subject matter, and rejected claims 1-11 under 35 USC 101 as claiming the same invention as that of claims 3-12, 14-23 and 26-28 of prior US Patent No. 6,628,740 B2. In response, Applicants have cancelled claim 2. In addition, Applicants have amended the cross-reference to related applications data in the specification to conform to the corrected filing receipt. No new matter has been added. In view of the foregoing amendments and remarks below, Applicants request reconsideration and withdrawal of the examiner's rejection and allowance of the subject application.

Claim Rejections – 35 USC 112, first paragraph – Written Description

The examiner rejected claim 1-23 for failing to comply with the written description requirement. In doing so, the examiner has asserted that the "specification does not specifically refer to forming or creating an electric field comprising two poles." Applicants respectfully traverse this rejection and note that although the specification does not specifically state that an electric field comprising two poles is formed or created, the specification does specifically teach one of ordinary skill in the art the formation and creation of an electric field comprising two poles. See Rule 132 Declaration of Bruno Coppi attached hereto as Appendix A ("Coppi"). Specifically, at page 49 of the specification, the application describes a method of converting fusion products in regard to a first embodiment of an inverse cyclotron converter (ICC) depicted in figures 19A and 19B as having "four or more equal, semi-cylindrical

electrodes 494 with small, straight gaps 497 make up the cylinder surface." The application further describes the operation of the first embodiment of the ICC as follows at page 49:

> In operation, an oscillating potential is applied to the electrodes 494 in an alternating fashion. The electric field E within the converter has a quadrupole structure as indicated in the end view illustrated in Fig. 19B. The electric field E vanishes on the symmetry axis and increases linearly with the radius; the peak value is at the gap 497.

The four poles of the electric field are clearly shown in Fig. 19B as arcs adjacent gaps 497 and labeled with an "E".

The application then describes at page 55 of the specification a second embodiment with an alternative electrode configuration as depicted in Figures 20A and 20B:

> As shown in Figs. 20A and 20B, alternative embodiments of the electrode structures 494 in the ICC 420 may include two symmetrical semi-circular electrodes and/or tapered electrodes 494 that taper towards the ion collector 492.

One of ordinary skill in the art would understand that, as an alternative, the two (2) electrodes shown in Figures 20A and 20B could be substituted for the four (4) electrodes shown in Figures 19A and 19B. Coppi ¶ 7. Further, one of ordinary skill in the art would understand that an oscillating potential applied to the two (2) electrodes in an alternating fashion, as described in regard to the first embodiment, would result in an electric field E within the ICC having a two pole structure due to the two (2) electrodes and the two (2) gaps there between. Coppi ¶ 7. Accordingly, the specification of the application includes a written description sufficient to convey to one of ordinary skill in the art that the applicants were in possession of an invention, as defined by claims 1

and 12, comprising a method of converting fusion product energies into electric power that includes forming or creating an electric field with two poles. Coppi ¶ 8. Thus, claims 1 and 12, and claims 3-11 and 13-23 by virtue of there dependence on claims meet the requirements for patentability under 35 USC 112, first paragraph in regard to the written description requirements.

Claim Rejections – 35 USC 112, first paragraph – Enablement

The examiner rejected claim 1-23 for failing to comply with the enablement requirement. In doing so, the examiner has asserted that there "is no adequate description nor enabling disclosure of what all is meant by and is encompasses by the reference to forming or creating an electric field comprising two poles." [emphasis in original]. The examiner concedes that the specification at page 49 in regard to the first embodiment in Fig. 19A "states that the electric field E within the converter has a quadrapole structure as indicated in the end view illustrated in Fig. 19B." The examiner also notes that "the electric field in the Fig. 20A embodiment would presumably have a two pole structure," but then asserts that "it is not clear that [a two pole electric field] structure is what applicant has intended..."

Applicants respectfully traverse this rejection and note that the specification does specifically teach one of ordinary skill in the art the formation and creation of an electric field comprising two poles. Coppi ¶¶ 5-8. Specifically, after describing at page 49 of the specification an inverse cyclotron converter (ICC) depicted in figures 19A and 19B as having "four or more equal, semi-cylindrical electrodes 494 with small, straight gaps 497 make up the cylinder surface," the application describes the operation of the first embodiment of the ICC to applying an "oscillating potential ... to the electrodes 494 in

an alternating fashion" and that the resulting "electric field E within the converter has a quadrapole structure as indicated in the end view illustrated in Fig. 19B." Coppi ¶ 5. As noted above, the four poles of the electric field are clearly shown in Fig. 19B as arcs adjacent gaps 497 and labeled with an "E".

Figure 20 B shows an end view of a converter of the second embodiment that appears the same as the end view of the first embodiment converter with the exception being that instead of four electrodes there are two electrodes. The application then at page 55 clearly refers to second embodiment as an alternative embodiment of the electrode structure as depicted in Figures 20A and 20B:

> As shown in Figs. 20A and 20B, alternative embodiments of the electrode structures 494 in the ICC 420 may include two symmetrical semi-circular electrodes and/or tapered electrodes 494 that taper towards the ion collector 492.

One of ordinary skill in the art would understand that, as an alternative, the two (2) electrodes shown in Figures 20A and 20B could be substituted for the four (4) electrodes shown in Figures 19A and 19B. Coppi ¶ 7. Further, one of ordinary skill in the art would understand that an oscillating potential applied to the two (2) electrodes in an alternating fashion, as described in regard to the first embodiment, would result in an electric field E within the ICC having a two pole structure due to the two (2) electrodes and the two (2) gaps there between. Coppi ¶ 7. Accordingly, the specification of the application includes a written description sufficient to teach one of ordinary skill in the art how to form or create an electric field with two poles. Coppi ¶ 8. Thus, claims 1 and 12, and claims 3-11 and 13-23 by virtue of their dependence on claims 1 and 12 respectively meet the requirements for patentability under 35 USC 112, first paragraph in regard to the enablement requirement.

Claim Rejections – 35 USC 112, second paragraph

The examiner rejected claims 1-23 as being indefinite. In doing so, the examiner has asserted that "the claims are vague, indefinite and incomplete, particularly as to what all is meant by and is encompassed by the reference to an electric field comprising two poles" as discussed in regard to the enablement requirement. For the reasons stated above in regard to the enablement and written description requirements, Applicants transverse this rejection and further submit that not only does the specification clearly teach and describe the formation and creation of an electric field with two poles, the claims 1 and 12 clearly and definitely claim a method of converting fusion product energies into electric power that includes forming or creating an electric field with two poles, which is sufficiently described in the specification of the application. Coppi ¶ 8. Thus, claims 1 and 12, and claims 3-11 and 13-23 by virtue of there dependence on claims meet the requirements for patentability under 35 USC 112, second paragraph.

Claim Rejections – 35 USC 101

The examiner rejected claims 1—11 under 35 USC 101 as claiming the same invention as that of claims 3-12, 14-23, and 26-28 of USPN 6,628,740 B2 (the "'740 patent"). In doing so, the examiner appears to be asserting that the claims of the '740 patent are inherently claiming the same invention as claims 1-11 of the subject application. Applicants respectfully traverse this rejection and submit that claims 1-11 of the subject application and the claims of the '740 patent are not claiming the "same invention." The examiner's reliance on inherency is improper. As each of the cases cited by the examiner indicates, and the examiner acknowledges, inherency refers to

the inherent teachings of a reference. Application of the inherency doctrine to the claims of a patent or application, as the examiner does here, would improperly read limitations from the specification into the claims.

The "same invention" means identical subject matter. *In re Vogel*, 422 F.2d 438, 441 (CCPA 1970). *Vogel* provides a test to determine if the claims are claiming the same invention:

> "A good test, and probably the only objective test, for 'same invention,' is whether one of the claims could be literally infringed without literally infringing the other. If it could be, the claims do not define identically the same invention..." *Id.*

Using *the Vogel test*, it is clear from a review of the claims that claims 1 and 3-11 of the subject application and the claims of the '740 patent do not claim the same invention. To illustrate, Table 1 provides a claim chart of claims 1-11 of the subject application and the claims of the '740 patent with the claim limitations of claims 1-11 clearly labeled (A) through (O). The corresponding claim limitations appearing in claims 3-12, 14-23 and 26-28 of the '740 patent have been labeled in the same manor.

Claims 1-11 v. Claims 3-12

Claims 3 and 4 of the '740 patent do not include step (B) "*converting substantially all of the injected ions' axial energy to rotational energy*" of claims 1 and 2-4 and, thus, cannot infringe claims 1 and 2-4 of the subject application.

Although claim 5 of the '740 patent includes step (B) and, thus, infringes claim 4 of the subject application, claim 4 of the subject application does not infringe claim 5 of the '740 patent. Specifically, step (E) "*further comprising the step of applying an oscillating potential to the first and second electrodes*" and step (F) "*further comprising the step of applying an oscillating potential to the first and second electrodes*" of claim 5

Application	'740 patent	'740 patent	'740 patent
1. A method of converting fusion product energies into electric energy, comprising the steps of **(A)** injecting ions along a helical path within a tapered cylindrical cavity formed by first and second tapered hemi-cylindrical electrodes in spaced relation with one another forming first and second elongate gaps there between, **(B)** converting substantially all of the injected ions' axial energy to rotational energy, **(C)** forming an electric field within the cavity, the electric field comprising two poles, and **(D)** converting at least a portion of the ion energy into electrical energy.	3. The method of claim 2 [The method of claim 1 [A method of converting fusion product energies into electric power, comprising the steps of **(A)** injecting ions along a helical path within a tapered cylindrical cavity formed by first and second tapered hemi-cylindrical electrodes in spaced relation with first and second elongate gaps formed there between, and **(D)** converting at least a portion of the ion energy into electrical energy **(E)** further comprising the step of applying an oscillating potential to the first and second electrodes]] **(F)** further comprising the step of creating an azimuthal electric field across the first and second gaps	14. The method of claim 13, [A method of converting fusion product energies into electric power, comprising the steps of **(A)** injecting ions along a helical path within a tapered cylindrical cavity formed by first and second tapered hemi-cylindrical electrodes in spaced relation with first and second elongate gaps formed there between, **(B)** converting substantially all of the ions axial energy to rotational energy, and **(D)** converting at least a portion of the ion energy into electrical energy] further comprising the step of **(E)** applying an oscillating potential to the first and second electrodes	26. A method of converting fusion product energies into electric power, comprising the steps of **(N)** creating first and second magnetic fields within a cavity formed in part by first and second tapered hemi-cylindrical electrodes in spaced relation with first and second elongate gaps formed there between, wherein field lines of the first and second magnetic fields extend in opposing directions, **(O)** joining the field lines of the first and second magnetic fields to form a magnetic cusp, **(A & H)** injecting ions in the form of an annular beam along a helical path within the cavity, **(J)** directing the annular beam through the magnetic cusp, and **(D)** converting at least a portion of the ion energy into electrical energy.

Elements = A, B, C, D	Elements = A, D, E, F	Elements = A, B, D, E	**(F)** further comprising the step of creating an azimuthal electric field across the first and second gaps. Elements = A, D, F, H, J, N, O
2. The method of claim 1, further comprising the step of **(E)** applying an oscillating potential to the first and second electrodes. Elements = A, B, C, D, E			
3. The method of claim 1, wherein the step of forming an electric field includes **(F)** creating an azimuthal electric field across the first and second gaps. Elements = A, B, C, D, F		15. The method of claim 14, further comprising the step of **(F)** creating an azimuthal electric field across the first and second gaps. Elements = A, B, D, E, F	
4. The method of claim 1, further comprising the step of **(G)** decelerating the ions. Elements = A, B, C, D, G	4. The method of claim 3, further comprising the step of **(G)** decelerating the ions Elements = A, D, E, F, G	16. The method of claim 15, further comprising the step of **(G)** decelerating the ions. Elements = A, B, D, E, F, G	27. The method of claim 26, further comprising the step of **(G)** decelerating the ions. Elements = A, D, F, G, H, J, N, O
	5. The method of claim 4, wherein the injecting step includes **(B)** converting substantially all of the ions axial energy to rotational energy. Elements = A, B, D, E, F, G		28. The method of claim 24, wherein the injecting step includes **(B)** converting substantially all of the ions axial energy to rotational energy. Elements = A, B, D, H, J, N, O

5. The method of claim 1, wherein the **(H)** ions are injected in the form an annular beam. Elements = A, B, C, D, H	6. The method of claim 5, wherein the ions are **(H)** injected in the form of an annular beam. Elements = A, B, D, E, F, G, H	19. The method of claim 18, wherein the ions are **(H)** injected in the form of an annular beam. Elements = A, B, D, H, I, N, O	
6. The method of claim 5 further comprising the step of **(I)** creating a magnetic cusp. Elements = A, B, C, D, H, I	11. The method of claim 7 further comprising the step of **(I)** creating the magnetic cusp. Elements = A, B, D, E, F, G, H, I, J	17. The method of claim 13 further comprising the step of **(I)** creating a magnetic cusp. Elements = A, B, D, I	
7. The method of claim 6, further comprising the step of **(J)** directing the annular beam through a magnetic cusp. Elements = A, B, C, D, H, I, J	7. The method of claim 6, further comprising the step of **(J)** directing the annular beam through a magnetic cusp. Elements = A, B, D, E, F, G, H, J	20. The method of claim 19, further comprising the step of **(J)** directing the annular beam through a magnetic cusp. Elements = A, B, D, H, I, J, N, O	
8. The method of claim 7, further comprising the step of **(K)** collecting charge neutralizing electrons from the annular beam as the electrons follow magnetic field lines of the magnetic cusp. Elements = A, B, C, D, H, I, J, K	8. The method of claim 7, further comprising the step of **(K)** collecting charge neutralizing electrons from the annular beam as the electrons follow magnetic field lines of the magnetic cusp Elements = A, B, D, E, F, G, H, J, K	21. The method of claim 20, further comprising the step of **(K)** collecting charge neutralizing electrons from the annular beam as the electrons follow magnetic field lines of the magnetic cusp. Elements = A, B, D, H, I, J, K, N, O	
9. The method of claim 8 further comprising the step of **(L)** collecting the ions once a substantial portion of their energy is converted to electric energy. Elements = A, B, C, D, H, I, J, K, L	9. The method of claim 8 further comprising the step of **(L)** collecting the ions once a substantial portion of their energy is converted to electric energy. Elements = A, B, D, E, F, G, H, J, K, L	22. The method of claim 16 further comprising the step of **(L)** collecting the ions once a substantial portion of their energy is converted to electric energy. Elements = A, B, D, E, F, G, L	

10. The method of claim 1 further comprising the step of **(M)** conditioning the electric energy converted from the ion energy to match existing power grids Elements = A, B, C, D, M	10. The method of claim 9 further comprising the step of **(M)** conditioning the electric energy converted from the ion energy to match existing power grids. Elements = A, B, D, E, F, G, H, J, K, L, M	23. The method of claim 16 further comprising the step of **(M)** conditioning the electric energy converted from the ion energy to match existing power grids. Elements = A, B, D, E, F, G, M	
11. The method of claim 6 wherein the step of creating the magnetic cusp comprises the steps of **(N)** creating first and second magnetic fields within the cavity, wherein field lines of the first and second magnetic fields extend in opposing directions, and **(O)** joining the first and second magnetic fields. Elements = A, B, C, D, H, I, N, O	12. The method of claim 11 further comprising the steps of **(N)** creating first and second magnetic fields within the cavity, wherein field lines of the first and second magnetic fields extend in opposing directions, and **(O)** joining the first and second magnetic fields. Elements = A, B, D, E, F, G, H, I, J, N, O	18. The method of claim 17 further comprising the steps of **(N)** creating first and second magnetic fields within the cavity, wherein field lines of the first and second magnetic fields extend in opposing directions, and **(O)** joining the field lines of the first and second magnetic fields. Elements = A, B, D, I, N, O	

of the '740 patent would result in "*forming an electric field within the cavity, the electric field comprising two poles.*" However, step (C) "*forming an electric field within the cavity, the electric field comprising two poles,*" of application claim 1 does not require the step of "*applying an oscillating potential to the first and second electrodes*" and "*further comprising the step of creating an azimuthal electric field across the first and second gaps*" and thus, does not infringe steps (E) and (F). To conclude otherwise would require an improper reading of limitations from the specification into application claims 1 and 2-4.

For the same reasons claim 4 of the subject application does not infringe claim 5 of the '740 patent, claims 5 through 11 of the subject application do not infringe claims 6 through 12 of the '740 patent. Application claims 5-11 also do not infringe claims 6-12 of the '740 patent because patent claims 6-12 include an extra step, step (G) "*decelerating the ions*", not included in application claims 5-11, and because patent claim 11 includes an extra step, step (J) "*directing the annular beam through a magnetic cusp*", not included in application claim 6. Claims 7-9 of the '740 patent also do not infringe application claims 7-9 because application claims 7-9 include an extra step, step (I) "*creating a magnetic cusp*", not included in claims 7-9 of the '740 patent.

Application claim 10 does not infringe claim 10 of the '740 patent because patent claim 10 includes extra steps, steps (G) "*decelerating the ions*," (H) "*ions are injected in the form an annular beam,*" (J) *"directing the annular beam through a magnetic cusp*," (K) "*collecting charge neutralizing electrons from the annular beam as the electrons follow magnetic field lines of the magnetic cusp*," and (L) "*collecting the ions once a substantial portion of their energy is converted to electric energy*" not included in application claim

10. Application claim 11 does not infringe claim 12 of the '740 patent because patent claim 12 includes extra steps, steps (G) "*decelerating the ions*," and (J) *directing the annular beam through a magnetic cusp*," and (K) "*collecting charge neutralizing electrons from the annular beam as the electrons follow magnetic field lines of the magnetic cusp*," not included in application claim 11.

Claims 1-11 v. Claims 14-23

Although claims 14 and 15 of the '740 patent infringe claim 1 and 3 of the subject application, application claims 1 and 3 do not infringe claims 14 and 15 of the '740 patent. Specifically, step (E) "*further comprising the step of applying an oscillating potential to the first and second electrodes*" and step (F) "*further comprising the step of applying an oscillating potential to the first and second electrodes*" of claims 14 and 15 of the '740 patent would result in "*forming an electric field within the cavity, the electric field comprising two poles.*" However, step (C) "*forming an electric field within the cavity, the electric field comprising two poles*" of application claims 1 and 3, as claimed, does not require "*applying an oscillating potential to the first and second electrodes*" and, thus, does not infringe step (E) of patent claims 14 and 15. To conclude otherwise would require an improper reading of limitations from the specification into these application claims.

Similarly, application claims 4 and 9-10 do not infringe patent claims 16 and 22-23 because patent claims 16 and 22-23 include steps, steps (E) "*further comprising the step of applying an oscillating potential to the first and second electrodes*" and step (F) "*further comprising the step of applying an oscillating potential to the first and second electrodes,*" not included in application claims 4 and 9 -10. In addition, patent claims

22-23 include a step, step (G) "*decelerating the ions*," not included in application claims 9 and 10, while application claim 10 includes steps, steps (I) "*creating a magnetic cusp,*" (J) "*directing the annular beam through a magnetic cusp,*" and (K) *"collecting charge neutralizing electrons from the annular beam as the electrons follow magnetic field lines of the magnetic cusp,*" not included in patent claims 22.

In addition, claims 17-21 of the '740 patent do not infringe application claims 5-8 and 11 because application claims 5-8 and 11 include an extra step, step (C) "*forming an electric field within the cavity, the electric field comprising two poles,*" not included in patent claims 17-21. Further, application claims 6 and 11 include an extra step, step (H) "*ions are injected into the from an annular beam,*" not included in patent claims 17-18. Likewise, patent claims 19-21 include extra steps, steps (N) "*creating first and second magnetic fields within the cavity, wherein field lines of the first and second magnetic fields extend in opposing directions,*" and (O) *"joining the first and second magnetic fields,"* not included in application claims 5 and 7-8.

Claims 1-11 v. Claims 26-28

Application claim 11 provides the closest match in claim limitations to claims 26-28 of the '740 patent. However, patent claims 26-27 do infringe application claim 11 because they do not include step (B) "*converting substantially all of the injected ions' axial energy to rotational energy.*" Although patent claim 28 would infringe application claim 11, application claim 11 would not infringe patent claim 28 because application claim 11 does not include the steps of (F) "*creating an azimuthal electric field across the first and second gaps*" and (J) *"directing the annular beam through a magnetic cusp."*

In view of the foregoing, it is clear that claims 1 and 3-11 of the subject application are not claiming the same invention as claims 3-12, 14-23 and 26-28 of the '740 patent and, thus, meet the requirements for patentability under 35 USC 101.

CONCLUSION

In view of the foregoing, Applicants submit that claims 1 and 2-23 are in condition for allowance. Should minor matter remain, the examiner is invited to contact the undersigned at (949) 567-6700.

Respectfully submitted,

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